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On certain Statements contained in a Communication to the Statistical Section at Belfast, in September, 1852, entitled "Statistics of Portsea and Portsmouth Dockyard." By LADY BENTHAM.

[Read before the Statistical Section of the British Association, 13th Sept., 1853.]

THE *Quarterly Journal of the Statistical Society* for this month contains the "Statistics of the Island of Portsea." The article had been communicated in the year 1852 to the British Association for the Advancement of Science; but as there are a few inaccuracies in that statement, I take the liberty of submitting to the British Association a few facts relative to the dockyard at Portsmouth, confining myself to occurrences of the end of the last, and beginning of the present century. I should not venture thus to encroach upon the time of the Association, were it not that, having had confided to me the copying of most of the private papers that passed between the then First Lord of the Admiralty and the Inspector-General of Naval Works, as also many of his official papers, I became acquainted with particulars not generally known at the time, and of others which, after the lapse of half a century, seem not likely that other persons should be acquainted with.

The *Journal* (p. 205) states, that "Apprentices continued to be a source of emolument to the professional officers down to the date when the Board of Revision sat, early in the present century." It must be observed, that the first report of the Commissioners of Naval Revision was not made till 13th June, 1805, whereas the Order in Council of 21st May, 1801, increased the salaries of dockyard officers, and at the same time decreed, "that on the commencement of the salaries under the new establishment, all pay on account of apprentices should cease, excepting only in those cases where it appears, by the indentures, that the master has engaged to make an allowance to the apprentice, in which case," &c., those increased salaries became payable on the 1st day of July, 1801.

To ascertain the approximate amount of the wine, sugar, groceries, &c., usually received by dockyard officers, General Bentham obtained from a master shipwright's assistant the quantities of these articles he had received within the year. From this document it appeared, that their cost at moderate prices would have exceeded the augmentation in his salary, independently of the great emoluments derived from apprentices. It must be remarked, that in this instance, at least, these presents were not on account of any particular service rendered to contractors, but were considered by them as authorized dues to dockyard officers.

In the same page, 205, of the *Journal* is a paragraph respecting the allowance of chips to artificers. The various abuses consequent upon this privilege were amongst the earliest ameliorations in dockyard management to which the Inspector-General of Naval Works directed his attention. Besides giving to Lord Spencer his opinion, that the privilege of chips should be abolished, he communicated to the chairman of the Committee of Finance, sitting in 1798, the mischievous consequences of the practice; the chairman, thereupon, issued

Note.—Some observations on Lady Bentham's letter, by John Fincham, Esq., late Master Shipwright of Her Majesty's Dockyard, have been forwarded by the Secretary of the Portsmouth and Portsea Literary and Philosophical Society, but want of space prevents their insertion in this No. of the *Statistical Journal*.—[Ed.]

an order to the Inspector-General, 17th April, to give his opinion upon the subject, which accordingly he gave as follows: "I am very decidedly of opinion, that it is highly expedient that the practice of carrying out of the dockyard any article whatsoever, under the denomination of chips, should be abolished;" he then entered into various particulars on which this opinion was grounded: amongst others, that he had "caused bundles of chips to be purchased as they came out of the dockyard, the price of which has been from 2*d.* to 8*d.* a bundle, whereas the pieces when put together have, in some instances, fitted so as to show that a spar, a deal, or a plank had been cut up for this purpose, and that the portion brought away in a single bundle could not have cost the public less than from two to eight shillings." He further stated the reasons which rendered it impossible for dockyard officers to prevent abuse of the privilege, and gave an instance where an officer, who had attempted it, was, in consequence, obliged "for some time to be guarded on his way to and from the dockyard." After noticing many collateral mischiefs, he concluded by saying: "I am convinced that, by abolishing the privilege of chips in all the naval establishments, great savings would arise to the public, far beyond what would defray the expense of the ample addition which it seems just and necessary to make to the pay of the artificers." From this time the abolition of the privilege was determined on by the Board of Admiralty, and the Inspector-General was looked to for an indication of the rate of allowance to be accorded in lieu of it. It was in conformity to his suggestions, that the rates of compensation were fixed upon by the Admiralty, and sanctioned by the King in Council, 21st May, 1801, namely, 6*d.* a day to shipwrights; to caulkers, joiners, and house-carpenters, 4*d.*; to scavengers and labourers, 3*d.* It was on this occasion, that the Inspector-General exhibited the facility with which weekly, instead of quarterly, payment might be made to the operatives. The paragraph in the Order in Council says: "this additional daily allowance, under the denomination of chip-money, should be paid *weekly* every Saturday, *after* the working-hours." The Navy Board were apprehensive of an outbreak of the operatives in consequence of this regulation; but they, as a body, were well pleased to be exempted from this necessity, as it were, of thievery, and no disturbance ensued.

Page 208 of the *Statistical Society's Journal* mentions the introduction of General Bentham to Portsmouth Yarl. It had happened that the General, having in operation a system of machinery of his invention it was visited by many of His Majesty's Ministers, amongst others by the First Lord of the Admiralty, who, in the course of repeated conversations, elicited several of the General's ideas respecting the dockyards; a wish was, in consequence, expressed that he could visit them, and that he should propose to do so. He accordingly addressed a letter to the Secretary of the Admiralty. The next day he received the following authority for visiting those establishments:—

"Admiralty Office, 22nd April, 1795.

"SIR,—Having taken into our consideration your letter to our Secretary of the 21st inst., wherein you propose to undertake a visit to the dockyards, in order to form a judgment of the instances in which any parts of your system of machinery might be introduced with advantage, and also for the purpose of enabling you the better to mature and point out the means of carrying into execution any further

ideas that might suggest themselves to you; and having in consequence thereof, given directions to the Commissioners of His Majesty's Navy to order their several officers to permit your having free admission into the said dockyards at all reasonable times, for the purposes above-mentioned, and to furnish you with such information and assistance as you may stand in need of, we do hereby authorize and allow you to repair to the several dockyards belonging to His Majesty, to examine into the several works and branches of business carried on there, and desire you to report to us your observations and ideas concerning all improvements of which the said works and branches of business, and the modes of carrying on the same, may in your judgment appear to be susceptible.

"We are, sir, your most humble servants,

"Spencer, Arden, Charles S. Pybus, C. Middleton,

"H. Seymour, P. Stephens, J. Gambier.

"Brigadier-General Bentham."

The *Journal* (p. 209) says: "Soon after this time, General Bentham conceived the plans for very extended improvements in the dockyards," a statement perfectly correct; but although he was desirous of rendering this yard "as complete as possible," this could hardly be considered his "*primary*" object—his first consideration having been not to recommend any work which would not compensate fully for the cost of construction by the savings it was likely to produce, and to object to all that would not do so. Hence arose his objection to a mast-pond that had been carrying on in Portsmouth Yard for about six years, but which, at the same rate of progress, would not have been completed in less than 176 years, and at the astounding expense of 132 *millions* of money; that is taking into account the enormous increase of real, though concealed, expenditure incurred by interest on capital expended. This fact caused the Committee on Finance, during their examination of the Inspector-General, on the 8th May, to ask the witness, "Is there any account kept of the interest of money expended in naval works?" To which he replied, "None in the dockyards, nor yet, I believe, in any of the public offices." He then gave instances of the many evils consequent upon this disregard of the value of the interest of money. The immensity of loss incurred, by neglecting to take interest of money into account, induced him to recur frequently to the subject in his official communications, but ineffectually, excepting as far as they related to works of his proposal.

Brigadier-General Bentham made his first report to the Admiralty on the 29th May. The reasons on which were grounded the alterations he proposed were, an alteration of the jetties, so as to render them doubly efficient; the construction of single instead of double docks; two additional docks, so that, together with the alteration of the jetties, during the same tide six ships might be taken out of the dock, and as many others taken in; a considerable extension of the basin, in order that dockings and undockings might be performed at any time of tide. By these works provision was made for the fitting of twelve ships of the line, at one and the same time, within the precincts of the yard, under the immediate inspection of the officers, instead of ships, as they were up to that time, being fitted at a distance in the harbour, away from inspection, subject to embezzlement and waste of materials, and to idleness and misconduct of the operatives employed upon them. Another of the important improvements he proposed, and which has been productive of immense savings, was the deepening of the sill of the basin, in order that any ship might be taken into it that could float over the rocky bed at

the entrance of the harbour; thus "ships with their *lading* may be taken into the basin without obstruction; and, in respect to as many ships as the basin will hold, the time employed in taking out and replacing the guns, provisions and stores of all kinds, will be saved." The new docks he proposed should be made of sufficient depth for receiving a ship with *all in*, and the existing shallow docks be made adequate to the same purpose by pumping into them. "These improvements made," he added, "I see no reason why a number of ships, equal to that of the docks in the basin, may not come in from Spithead, have their bottoms inspected and cleaned, and go out again fit for sea in the course of three days." In fact, in consequence of these improvements, ships have been so dealt with, the time from one spring tide to the other, saved, and sometimes, indeed, two or three spring tides.

The General's views were highly appreciated, so that their Lordships induced him to relinquish foreign service, and to re-engage in that of his country as Inspector-General of Naval Works, an office created expressly on his account, and sanctioned by Order of Council, 23rd March, 1796: an appointment it is only worth reverting to on account of the very important influence it had on the statistics of the naval establishments in the Island of Portsea.

Page 210 of the *Statistical Society's Journal* gives an erroneous account of the wood mills. It may be seen by their Lordships' letter, 22nd April, 1795, that one of the objects in view, in authorizing his visit to the dockyards, was, that he might "form a judgment of the instances in which any parts of your *system of machinery* might be introduced with advantage." In private conferences with the First Lord, the General recommended the introduction of a considerable variety of the machinery of his invention, amongst others an adaptation of it to making blocks and to give motion by steam-engines. The Navy Board felt alarmed lest their introduction should cause strikes of operatives, feared that steam-engines would set fire to the dockyards, and be productive of other evils; so that, although many of the machines from the General's habitation were already on their way to Portsmouth, the Admiralty privately advised him to refrain from recommending *officially* either his machinery, or a steam-engine to work it, till the time when new pumping apparatus was required in Portsmouth Yard; then, on the 21st December, 1797, he officially proposed a steam-engine, with pumping apparatus, and machinery. This proposal specified in particular, sawing in general, both lengthwise and cross-cutting, edging, tonguing, and grooving, the making of treenails, saying that, "These, amongst various other instances, had occurred to me as giving occasion in His Majesty's dockyards for the substitution of the invariable accuracy of machinery for the uncertain dexterity of more expensive manual labour." The proposal was adopted: several of Bentham's machines were sent to Plymouth as well as to Portsmouth Yard, and by degrees put to work, the force employed being at first that of men. Some of these machines were seen in operation by the Board of Admiralty, in 1802, previously to the arrival of the first of Mr. Brunel's machines.—The model sent to the Admiralty of Mr. Brunel's machine was confined to the cutting and shaping of the shells of blocks, and was, in fact, little more than an adaptation to that particular purpose of several of the inventions the Inspector-General had specified in his patent of 1793. That same

paragraph of the *Journal*, in saying that "the machinery, already constructed in London, was transferred to Portsmouth," is altogether erroneous, if intended to imply that those machines were Mr. Brunel's, for, in point of fact, he never possessed, nor had had made, a single machine for making blocks of full size; his model, exhibited to the Admiralty, being capable of nothing more than shaping a shell of about an inch and a half long: one of its produce he presented to the writer of these lines. Machines used in block making were, indeed, sent from London; but they were General Bentham's machines, not one of them Mr. Brunel's—a fact which can be vouched for, all the bills for the block-making machinery having passed through the writer's hands in the year 1808, and having not long ago been re-examined.

The remuneration to be awarded to Mr. Brunel was considered extremely difficult, as, according to different calculations, it was made to amount to sums varying from about 6,000*l.* to above 20,000*l.* At length the investigation requisite was confided to Sir Samuel Bentham. The savings in the block manufactory resulted from very different sources: there were savings of contractor's profits; savings from the use of Bentham's machines, particularly all of those money-saving ones, all of them Bentham's, for sawing and preparing materials in readiness for the shaping of the blocks and making the sheaves; there were savings arising from good management of the concern, these, too, were consequent upon the mode of management Bentham introduced; and savings arising from the machines which Brunel had a prominent share in adapting to the particular purpose of making blocks. Sir Samuel, in his report, waived his own rights, and recommended that Mr. Brunel's remuneration should be the whole of the savings that were made in a year by the manufacturing of blocks in Portsmouth Dockyard.

The calculations that appear, page 211 of the *Journal*, can hardly have been from good authority, since none such were made in the wood mills, at least up to the end of the year 1812. The shot-rack machine was the invention of Mr. Barr, the master of the wood mills, under General Bentham; so many of the other machines enumerated in the same page are those which were taken from General Bentham's residence, or duplicates of them, or introduced in conformity to his specification of 1793.

The machinery in the wood mills has, in truth, proved of great advantage, since it is admitted that the display of it there, together with Bentham's patents of 1791 and 1793, have given rise to most of the machinery for working wood, and even metals, which, of late years, have added so much to the national wealth.

In a statistical account of Portsea, the metal mills in the dockyard should not be omitted, for therein the savings to Government greatly exceeded those derived from the block machinery and other products at the wood mills. In November, 1812, the savings made at the metal mills amounted to the sum of 40,954*l.* 12*s.* 8*d.* per annum, and this before copper bolts were melted there, on which the profits were more considerable than on sheathing. The wood mills, the metal mills, and the millwrights, were placed by the Admiralty under the Inspector-General's individual management in 1805, and remained as much so as if they had been his private concerns till the end of the year 1812. The operatives employed under the General were of

different descriptions, some few of them skilled workmen, most of them labourers at labourers' pay, others, especially in the wood mills, children. They were all paid weekly, none of their time was lost in musters, and, whenever practicable, the work done was paid for by the piece, so that the industrious skilful workman was amply remunerated according to his deserts, whilst others received pay for no more work than they had actually done.

The safety and the amplitude of Spithead as a roadstead, the facility with which it can be gained in stormy weather, renders Portsmouth the most important of our dockyards; and, during the whole of last war, very much more work was done there in quantity, and at less cost, than at any other of the royal naval establishments, an *esprit de corps* existed too in both officers and operatives, which preserved it from many of the mischiefs observable in other dockyards: so that no such abuses were observable at Portsmouth as were discovered by the Commissioners of Naval Inquiry at Plymouth, for example; Portsmouth was, therefore, well chosen as the source from which example should be drawn of the habitual waste and mismanagement that had place in the manufacturing concerns of the Navy. Lord Spencer, anxious to correct abuses, encouraged the Inspector-General to furnish instances of waste and unnecessary expenditure as they occurred at that port. Glaring extravagance took place in the manner in which timber was habitually converted, many examples of which were given to his Lordship, the Inspector-General, at the same time, pointing out that such abuses were unfailing consequences of *divided* responsibility, so that blame could not be attached to any individual. The First Lord perceived that half measures would be of no avail, and therefore charged the Inspector-General to mature his ideas respecting a *radical reform* of dockyard management, and, in conjunction with Sir Evan Nepean, to draw up a report on the subject, such as their Lordships could submit to the Privy Council; that report to be grounded on the fundamental principles held forth by the Inspector-General. These principles were the introduction of individual responsibility throughout; the entire separation of the accountant from the operative department, whereby the one might be a real check upon the other; the placing all operative concerns under one chief operative officer, making him individually responsible for all the manufacturing business of a dockyard; but, at the same time, placing, as the eye of the Admiralty, a superior officer to see what was going on, and to report his observations to their Lordships, he having also power, whenever a day's delay might be injurious, either to countermand any operation he might think so, or to order whatever he might look upon as beneficial; in all cases, however, of such interposition, the order to be given *in writing*, so that it might remain on record, and further, that the circumstance should, on the *same day*, be reported to the Admiralty. The first idea of this arrangement was given in the Inspector-General's evidence to the Committee on Finance; and the matured measure was, in 1800, printed by the Admiralty in their sketch of a Report to the Lords of the Privy Council. The whole of the measures therein proposed were under further consideration, when the Speaker intimated that the House of Commons would no longer admit of delay of their Lordships' Report on the measures proposed by the Commissioners of Inquiry, whereupon a short report was

hastily prepared by the Inspector-General, again in conjunction with Sir Evan Nepean, was signed by Earl Spencer's Board, 31st January, 1801; but before it could be submitted to the Privy Council, a change of administration took place, the Earl of St. Vincent being appointed First Lord of the Admiralty. His Lordship had, by Earl Spencer's desire, been consulted by the Inspector-General as to the proposed regulations, and had expressed himself convinced of their expediency; so that, when his Lordship came to preside at the Admiralty, he, without hesitation, presented to the Privy Council the Report as signed by the preceding Board.

This report stated, in the first paragraph, that their Lordships had "already made some progress in the preparation of a new system of management, founded on general principles of acknowledged efficacy," gave a general scheme of increased salaries to the several officers and clerks of the dockyards, and agreed with the Commissioners of Inquiry that chips should be abolished.—On the subject of timber, their Lordships expressed themselves to be "very fully convinced of the necessity of adopting some radical improvement in the management of this branch of business;" and proposed various regulations, all of them subservient to the making a single officer individually responsible for its management from the time of receipt to that of its being put to use, at the same time ensuring on its receipt conformity to agreement for it, and showing in the accounts in what service it had been employed. That report having been sanctioned by the King in Council, the carrying the new timber regulations into effect was confided to the Inspector-General, as were the new regulations relating to this store, the forms for accounts, details of management, and instructions to dockyard officers, from the first receipt of timber to its appropriation to use. For three months the introduction of the new mode of management was confided to him. There occurred no difficulty in the dockyards; but contractors found their interests damaged by the necessity they were under of conforming to the terms of contract. Immense savings resulted from these regulations: they continued in force for many years, but by degrees responsibility was done away with by dividing the duty of the timber master amongst several officers—at Portsmouth, the store-keeper, the store-receiver, the timber-inspector, as shown by the navy estimates for 1853–54.

It appears, however, that the fundamental principles on which the proposed reform of 1800 was grounded, are by degrees being acted upon, although Lord St. Vincent found opposition to them in many quarters. In a late investigation, the surveyor of the navy said he considered himself responsible for the number and qualifications of operatives employed in the dockyards; and, in the regulations of 3rd of last March, many officers are made individually responsible for their recommendations of apprentices, artificers, and officers for promotion; as is likewise the surveyor of the navy made responsible; even the superintendent, in his report, is to state "his own opinion of the capacity of the candidates;" and what is of first rate importance, on various occasions reports and recommendations are required to be in *writing*, thereby assuring that responsibility which verbal statements never afford.
